AWIPS SOFTWARE INSTALLATION INSTRUCTION NOTE 38 (for Electronics Technicians)
Maintenance Logistics, and Acquisition Division
W/OST32: BG
W/OPS1: FJZ

SUBJECT : Activation of GOES-12 at AWIPS OB1 Sites

PURPOSE : Provide OB1.x AWIPS sites transition instructions to accommodate Geostationary Operational Environmental Satellite (GOES)-12–era imagery.

PATCH NUMBER : N.A.

EFFECTIVITY : All AWIPS OB1.x sites using GOES East

REINSTALLATION REQUIREMENTS : These procedures should be used by OB1.x sites using GOES East.

ESTIMATED TIME REQUIRED : Approximately one hour.

EFFECT ON OTHER INSTRUCTIONS : None.

AUTHORIZATION : The authority for this modification is NWS Request for Change AA078.

VERIFICATION STATEMENT : Testing of these procedures was conducted on the following site test machines: NAPO, NMTW, and TBW3. Testing was somewhat limited due to relatively brief availability of continuous streams of GINI-format GOES-12 test data while the imager instrument was in its primary modes of operation (i.e., routine & rapid scan) for GOES East. These procedures were tested on both Linux and HP workstations in AWIPS OB1 and OB2.

SECURITY LEVEL : Root

GENERAL:

On April 1, 2003, at approximately 1815 UTC, GOES-12 is scheduled to replace GOES-8 as the operational GOES East satellite. The imagers on GOES-8, 9, 10 & 11 are essentially identical. Since 1995, both GOES East and West have had matching imagers from this series of satellites. The imagers on GOES-12 and (the yet-to-be-launched) GOES-N are different from those of the GOES-8–11 series. The differences are described in some detail at:

http://www.oso.noaa.gov/goes/goes-calibration/change-channels.htm

In brief, the differences between the GOES-12 and GOES-8-11 imagers are as follows:

- The resolution of the GOES-12 water vapor channel (i.e., channel 3) is 4 km, as opposed to 8 km in the pre-GOES-12 satellites.
- The central wavelength of the GOES-12 water vapor channel is 6.5 µm, as opposed to 6.7 µm in the earlier satellites. The spectral response of the GOES-12 water vapor channel is also wider than those of GOES-8–11.
- Channel 5 (the 4km resolution 12 µm channel on pre-GOES-12 satellites) is replaced on GOES-12 by channel 6 (a new 8km resolution channel centered at 13.3 µm).

Some “AWIPS sectors” of GOES imagery are supplied, on the SBN, at reduced resolutions and are not impacted by the resolution changes.

For a period of time, GOES-12 is expected to operate in conjunction with an older-type GOES (i.e., GOES-8–11). Due to insufficient channels necessary to complete the composite image, the mixed-satellite configuration does not allow large scale composites on channels 5 and 6. When GOES-12 becomes operational, two-satellite composites of 3.9 µm imagery will be discontinued. The two discontinued images from the SBN GOES channels will be the Northern Hemisphere [World Meteorological Organization (WMO) headers TIGF03 & 04] and the SuperNational (WMO headers TIGN03 & 04).

Beginning in OB1, AWIPS sites will use localization to adjust to changes in the imager type of their operational GOES spacecraft. Localization has been modified to read a new configuration file:

```
/data/fxa/nationalData/GOESImagerInfo.txt
```

This file contains flags that indicate the generations of the imagers on GOES East and West. The first line in this configuration file is relevant to the GOES-12 activation. The first two lines of the GOESImagerInfo.txt file, as deployed on the OB1 install CD, is as follows:

```
EAST            1
WEST            1
```

These flags correspond to the “first generation” imagers on GOES-8 and GOES-10. GOES-12 has a “second generation” imager and, when GOES-12 replaces GOES-8 as GOES East, sites using it should edit one character of this file as follows:

```
EAST            2
WEST            1
```

The “-tables” option of localization has always resolved a site’s default GOES satellite: East or West. Now, localization also checks this configuration file to determine the generation of the imager on that satellite. After localization determines the imager’s generation, it selects the appropriate satellite menu file(i.e., either ijklSatDatamenu.txt or mnopqSatDataMenu.txt).

During the AWIPS build 5 era, the AWIPS baseline D-2D Satellite menu file has been:

`/data/fxa/nationalData/SatDataMenus.txt`

Beginning in OB1, there are two national baseline satellite menu files:

`/data/fxa/nationalData/ijklSatDatamenu.txt` (corresponds to GOES-8–11)
`/data/fxa/nationalData/mnopqSatDatamenu.txt` (corresponds to GOES-12, N, etc)

NOTE: OB1 Sites using localization to override the baseline D-2D satellite and maintain custom or localization file such as:

`/awips/fxa/data/localization/<siteID>/<siteID>-satDataMenus.txt`

should be replaced with the following two files:

`/awips/fxa/data/localization/<siteID>/<siteID>-ijklSatDatamenu.txt`
`/awips/fxa/data/localization/<siteID>/<siteID>-mnopqSatDatamenu.txt`

No product buttons for 13µm imagery should appear in `<siteID>-ijklSatDatamenu.txt` (since GOES 8-11 lacks that channel). Likewise, no product buttons for 12µm imagery should appear in `<siteID>-mnopqSatDatamenu.txt`. Otherwise, the contents of these two files could be identical. Only one file (either the “ijkl” or the “mnopq” version) will be used during any one localization.

PROCEDURE

A. GOES-12 Activation Procedures for OB1 Sites

AWIPS sites that use GOES East should follow these procedures around the time GOES-12 is activated. However, these procedures need not be executed on the precise day of GOES-12 activation. Should a GOES East site choose to defer these activation steps, the site will begin to receive GOES-12 imagery on the SBN, however the new 13µm imagery will be mislabeled as 12µm imagery (in D-2D) until these activation steps are executed.

1. At an AWIPS workstation, exit any running instances of D-2D, open a telnet window, log in as `awipsusr`, and remote log in to ds1 by typing:

   `rlogin ds1 -l root`

2. As user **`fxa`**, move to the /data/fxa/nationalData directory:

   `su – fxa`
   `cd /data/fxa/nationalData`

3. Using the text editor of your choice, edit the GOESImagerInfo.txt file to update the GOES East imager flag from “1" to “2". After editing, the first two lines of this file should appear as follows:

   ```
   EAST  2
   WEST  1
   ```

4. Log in to px1:

   `rlogin px1`

5. As user **`fxa`**, relocalize px1 with the **`tables`** option. For example:

   `cd /awips/fxa/data/localization/scripts`
   `./mainScript.csh -tables`

6. Stop, then restart ingest on px1. For example, on px1, from within the `/awips/fxa/bin` directory, as user **`fxa`** type:

   `./stopIngest.px1`
   `./startIngest.px1`

7. As user **fxa**, relocalize one workstation with the `tables` option. For example:

   ```
   rlogin lx1
   cd /awips/fxa/data/localization/scripts
   ./mainScript.csh -tables
   ```

8. Re-start D-2D for the workstation relocalized in step 7.

9. Verification steps: Wait 15-30 minutes after installing the patch and after GOES-12 is activated to verify the decoding and the relocalized workstation are functioning normally. Verify the workstation can display GOES-12 satellite data:

   a. Check the satellite decoder log on px1 for channel 6 imagery messages. See examples in Appendix A, Satellite Decoder Examples.

   b. Check the localization log (/data/logs/fxa/localization.log) of either the just-relocalized workstation or px1 for messages such as:

      ```
      Using EAST satellite.
      The satellite imager type is: 2
      ImagerType is 2, grabbing mnopqSatDatamenu.txt file
      ```

   c. Check the D-2D Satellite menu. It should now be GOES-12–ready, as confirmed by the appearance of 13 µm entries.

   d. From the D-2D satellite menu, select the most recent channel 6 (13 µm) image. The time of the selected image must be after the last px1 ingest restart. Images (13 µm) selected from before the ingest restart are older channel 5 images that will be auto-purged as old channel 5 imagery is replaced by new incoming channel 6 imagery. Verify:

      (1) The product label marking resembles “13 µm Satellite”.

      (2) Cursor sampling should be in degrees C.

      (3) The new channel 6 imagery should roughly resemble channel 5 imagery. There is a greater lower tropospheric contribution to the new channel. In clear areas (which can be ascertained from more-familiar channels) the channel 6 imagery is usually cooler (appearing somewhat lighter) than channel 5 imagery.

10. After verifying the single GOES-12 workstation operates properly, refer to step 7 to localize the remaining workstations. Restart D-2D.

11. Within 24 hours of activating GOES-12 at your site, relocalize px2, as was done to px1, in step 5, above.

This completes the OB1 GOES-12 activation procedures.

REPORTING MODIFICATION

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in the NWS Instruction 30-2104, Maintenance Documentation, Part 4, and Appendix F. A sample EMRS report is included as an attachment. As an additional guide, use the information in the table below.

Block #	Block Type	Information
5	Description	Activate GOES-12 for OB1 sites IAW AWIPS Software Installation Instruction Note 38.
7	Equipment Code	AWIPS
8	Serial Number	001
15	Comments	Activate GOES-12 for OB1 sites IAW AWIPS Software Installation Instruction Note 38.
17a	Mod. No.	S38

Signature Not Verified

Mark S. Paese

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Appendix A - Satellite Decoder Examples
Appendix B - WS Form A-26 Sample

Appendix A - Satellite Decoder Examples

Below are examples of normal and abnormal satellite decoder logs on px1, in the `/data/logs/fxa/<date>` directory, example file name: Satdecoder4363px1-napo000305).

Example 1.

This is a normal state. If the site is configured for GOES-12 and is receiving (e.g., via the site's SBN feed) data from GOES 12, the sat decoder log, on px1 has the following entries:

```
16:21:39.824 decodeSat.C USE: Decoder Output Ir
16:25:59.924 decodeSat.C EVENT: NCF_ENTRY [1/1] =
TIGW06KNES.11162555.483
16:26:00.211 sat.C EVENT: Notified 152 Nov 10 01 20:00:00 GMT
16:26:00.211 pdsAdvise.C EVENT: NCF_STORE
/data/fxa/sat/SBN/netCDF/westCONUS/conus_i12/20011110_2000 has been
created.
```

The above entry indicates channel 6 imagery (13 µm) is being received. The channel 6 imagery is being decoded and stored (in the `conus_i12` directory). The following is a West CONUS example. If GOES-12 is activated as GOES East, the East CONUS sectors will be labeled TIGE06.

Example 2.

This is an error state. If the site is configured for GOES-12 and is receiving (e.g., via the site's SBN feed) data from GOES 8, 9, 10, or 11, the sat decoder log, on px1 has the following entries:

```
17:35:31.511 decodeSat.C EVENT: NCF_ENTRY [1/1] =
TIGW03KNES.11173522.773
17:35:31.512 pdsAdvise.C EVENT: NCF_FAIL Could not lookup key for:
5 2    327682
17:35:31.513 decodeSat.C PROBLEM: NCF_FAIL Unknown product for
channel = 5 sector = 2
17:35:31.513 decodeSat.C PROBLEM: NCF_FAIL error on file
/data/fxa/sat/SBN/Raw/TIGW03KNES.11173522.773
```

The example above shows that channel 5 imagery (12 µm) is being received. However, the site is configured for GOES-12, which does not have a channel 5.

Example 3.

This is an error state. If the site is configured for GOES 8-11 (the older-style imager) and is receiving data (e.g., by way of the site's SBN feed) from GOES 12, the sat decoder log, on px1 has the following entries:

```
15:21:28.427 decodeSat.C EVENT: NCF_ENTRY [1/2] =
TIGW06KNES.11150906.425
15:21:28.445 pdsAdvise.C EVENT: NCF_FAIL Could not lookup key for:
6 2    393218
15:21:28.446 decodeSat.C PROBLEM: NCF_FAIL Unknown product for
channel = 6 sector = 2
15:21:28.447 decodeSat.C PROBLEM: NCF_FAIL error on file
/data/fxa/sat/SBN/Raw/TIGW06KNES.11150906.425
```

The example above shows that channel 6 imagery (13 µm) is being received. However, the site is configured for GOES-8-11, which does not have a 13 µm channel.

Example 4

This is a normal state. If the site is configured for GOES 8-11 and is receiving (e.g., by way of the site's SBN feed) data from GOES 8-11, the sat decoder log, on px1 has the following entries:

```
00:45:05.316 decodeSat.C USE: Decoder Output Ir
00:45:11.966 decodeSat.C EVENT: NCF_ENTRY [1/1] =
TIGW03KNES.12004503.058
00:45:12.717 sat.C EVENT: Notified 152 Dec 12 01 00:30:00 GMT
00:45:12.718 pdsAdvise.C EVENT: NCF_STORE
/data/fxa/sat/SBN/netCDF/westCONUS/conus_i12/20011212_0030 has been
created.
```

The example shows that channel 5 imagery (12 µm) is being received. The channel 5 imagery is being decoded and stored in the conus_i12 directory.

Attachment B - Sample EMRS Form